

REMARKS/ARGUMENT

Applicant responds herein to the Office Action dated November 23, 2005.

Regarding the Claims in General:

Claims 1-16 are now pending. Claims 1-10 are withdrawn from consideration as being directed to a non-elected invention. Claims 11-14 have amended to address rejections stated in the outstanding Office Action and to eliminate certain artifacts of translation for improved form. These claims are believed to recite explicitly what was already at least implicit in the claims as previously presented, and have therefore not been narrowed for statutory purposes related to patentability.

New claim 16 has been added to afford applicant additional protection to which he appears to be entitled in view of the known prior art.

Regarding the Rejection under 35 U.S.C. 112:

The Examiner's attention is respectfully directed to the fact that for purposes of the invention, failure has been treated as evidenced by deterioration of the transmitted signal light (see, for example, page 12, lines 7-13). Nevertheless, claims 11-13 have been amended to address the rejection by focusing on deterioration, rather than failure. No change in scope is intended, however.

Regarding the Prior Art Rejections:

In the outstanding Office Action, claims 11-15 were rejected under 35 U.S.C. 102(b) as being anticipated by Namiki et al. U.S. Published Patent Application 2001/0050802 (Namiki). Reconsideration and withdrawal of this rejection are respectfully requested in view of the amendments herein.

Namiki is directed to compensation for light signal deterioration in Raman amplifier optical transmission systems but addresses the problem in a manner which is quite different from that of the present invention. In particular, in Namiki, the transmitted signal is monitored and if any deterioration, for example, due to amplifier malfunction, is detected, the operation of other

amplifiers is adjusted to provide compensation. Indeed, Namiki is similar to the techniques described on page 2 of the instant specification.

In contrast, the present invention provides a small number of spare Raman amplifiers located at intervals along the optical system. These are normally non-functional, and are operated only when necessary to restore a transmitted optical signal which has been deteriorated due to an upstream malfunction.

The distinctions between the method according to the present invention, and that taught by Namiki are clearly stated in the present claims.

In particular, claim 11 as amended is directed to a method for amplifying signal light in an optical transmission system including first and second pluralities of Raman amplifiers. The claimed method comprises the steps of:

amplifying said signal light by said first and second light sources for Raman amplification;

transmitting said amplified signal light through said optical transmission line;

providing one or more spare pumping light source for said plurality of second light sources for Raman amplification, the number of said spare pumping light sources being less than the number of said second light sources;

detecting a deteriorated state of said signal light amplified by one or more of said first and/or second light sources for Raman amplification; and

restoring said deteriorated signal light to an un-deteriorated state by emitting spare pumping light from at least one of said spare pumping light sources,

said spare pumping light sources being operated only when required to restore deteriorated signal light.

Namiki does not disclose, teach or suggest providing one or more spare pumping light sources, the number of which is less than the number of second light sources, nor does it teach restoring a deteriorated light signal to a non-deteriorated state by use of at least one spare

pumping light source, nor does it suggest providing spare pumping light sources which are used only when necessary to restore deteriorated signal light. Nor does it disclose or suggest apparatus which could be used to practice the claimed method. Claim 11 is patentable over Namiki for at least these reasons.

New claim 16 is also patentable over Namiki. This is similar to claim 11, but employs different terminology, and is of slightly different scope. In particular, claim 16 recites:

An optical amplification method for an optical transmission system including a plurality of first Raman amplifiers for amplifying signal light at a first wavelength transmitted in said optical transmission line and a second plurality of second Raman amplifiers for amplifying signal light at a second wavelength transmitted in said optical transmission line, wherein ones of said plurality of second Raman amplifiers are disposed at positions adjoining respective ones of said first Raman amplifiers, said method comprising the steps of:

amplifying said signal light at said first and second wavelengths by said first and second Raman amplifiers;

transmitting said amplified signal light through said optical transmission line;

providing a single spare Raman amplifier operating at said first wavelength for each n-number of said first Raman amplifiers, and a single spare Raman amplifier operating at said second wavelength for each n-number of said second Raman amplifiers;

detecting a deteriorated state of said signal light in said optical transmission line at said first wavelength, and/or said second wavelength and

restoring said deteriorated signal light to an un-deteriorated state by operating said first and/or said second spare Raman amplifiers,

said spare Raman amplifiers being operated only when required to restore deteriorated signal light at their respective operating wavelengths.

Namiki does not disclose, teach or suggest an optical amplification method in which a single spare Raman amplifier operating at a first wavelength is provided for each n-number of

Raman amplifiers operating at that first wavelength, and a single spare Raman amplifier operating at a second wavelength for each n-number of Raman amplifiers operating at that second wavelength, and wherein the spare Raman amplifiers are not used except to restore a deteriorated signal light at its associated bandwidth. Nor does Namiki disclose apparatus which could be used to practice the claimed method. Claim 16 should therefore also be allowed.

Claims 12-15, are dependent on allowable claim 11 and are also allowable for the reasons stated above. In addition, these claims recite features which, in combination with the features of their respective parent claims are neither taught nor suggested in Namiki.

Accordingly, the Examiner is respectfully requested to reconsider the application, allow the claims as amended and pass this case to issue.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on February 23, 2006

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February 23, 2006

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